



SEQLIST 10563310.TXT

SEQUENCE LISTING

<110> Carlsson, Jorgen
Stahl, Stefan
Eriksson, Tove
Gunneriusson, Elin
Nilsson, Fredrik

<120> POLYPEPTIDES HAVING BINDING AFFINITY FOR
HER2

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<140> US 10/563,310

<141> 2006-05-12

<150> PCT/SE2004/001049

<151> 2004-06-30

<150> SE 0301987-4

<151> 2003-07-04

<150> SE 0400275-4

<151> 2004-02-09

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1 5 10 15
Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Ala Phe Ile Gln
20 25 30
Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
35 40 45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Gln Ala Tyr Trp Glu Ile
1 5 10 15
Gln Ala Leu Pro Asn Leu Asn Trp Thr Gln Ser Arg Ala Phe Ile Arg
20 25 30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala

SEQLIST 10563310.TXT

Lys Lys 35 40 45
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Val Asp Asn Lys Phe Asn Lys Glu Pro Lys Thr Ala Tyr Trp Glu Ile
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Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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Gln Arg Leu Pro Asn Leu Asn Asn Lys Gln Lys Ala Ala Phe Ile Arg
20 25 30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
35 40 45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
50 55

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Tyr Asn Leu Pro Asn Leu Asn Arg Ala Gln Met Arg Ala Phe Ile Arg
20 25 30
Ser Leu Ser Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
35 40 45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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          20          25          30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
          35          40          45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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          20          25          30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
          35          40          45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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          20          25          30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
          35          40          45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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Ala Leu Leu Pro Asn Leu Asn Asn Gln Gln Lys Arg Ala Phe Ile Arg
          20          25          30

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SEQLIST 10563310.TXT

Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Val Gly Leu Pro Asn Leu Asn His Phe Gln Val Arg Ala Phe Ile Arg
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 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Val Leu Leu Pro Asn Leu Asn Arg Trp Gln Ile Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Ala Leu Leu Pro Asn Leu Asn Asn Met Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Val Val Leu Pro Asn Leu Asn Arg Met Gln Ile Arg Ala Phe Ile Arg
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 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Ala Thr Leu Pro Asn Leu Asn Asn Lys Gln Ile Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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<400> 19

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Val Asp Asn Lys Phe Asn Lys Glu Phe Arg Asn Ala Tyr Trp Glu Ile
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Val Val Leu Pro Asn Leu Asn Asn Arg Gln Lys Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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Val Asp Asn Lys Phe Asn Lys Glu Phe Arg Asn Ala Tyr Trp Glu Ile
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Ala Lys Leu Pro Asn Leu Asn Asn Gly Gln Lys Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
    50      55

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 1      5      10      15
Ala Leu Leu Pro Asn Leu Asn His Ser Gln Thr Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
    50      55

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<400> 22

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Val Asp Asn Lys Phe Asn Lys Glu Pro Arg His Ala Tyr Trp Glu Ile
 1      5      10      15
Val Lys Leu Pro Asn Leu Asn Ser Leu Gln Lys Arg Ala Phe Ile Arg

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SEQLIST 10563310.TXT

Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 20 25 30
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Gly Leu Pro Asn Leu Asn Ser Arg Gln Ser Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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 1 5 10 15
 Ala Gly Leu Pro Asn Leu Asn Pro Lys Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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 1 5 10 15
 Thr Gln Leu Pro Asn Leu Asn Thr Arg Gln Thr Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Val Leu Leu Pro Asn Leu Asn Trp Glu Gln Asn Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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 Thr Gln Leu Pro Asn Leu Asn Arg Glu Gln Asn Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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 Ala Thr Leu Pro Asn Leu Asn Thr Asn Gln Ser Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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Val Asp Asn Lys Phe Asn Lys Glu Met Arg Asn Ala Tyr Trp Glu Ile
 1      5      10      15
Val Gly Leu Pro Asn Leu Asn Arg Trp Gln Ser Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Asn Ala Tyr Trp Glu Ile
 1      5      10      15
Val Lys Leu Pro Asn Leu Asn Pro Trp Gln His Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50      55

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 1      5      10      15
Val Lys Leu Pro Asn Leu Asn Val Arg Gln Ser Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50      55

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Val Asp Asn Lys Phe Asn Lys Glu Asn Arg Thr Ala Tyr Trp Glu Ile
 1      5      10      15

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SEQLIST 10563310.TXT

Val Lys Leu Pro Asn Leu Asn Asp Tyr Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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 1 5 10 15
 Thr Gln Leu Pro Asn Leu Asn Arg Leu Gln Ser Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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 1 5 10 15
 Ala Gly Leu Pro Asn Leu Asn Ala Gln Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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 1 5 10 15
 Val Arg Leu Pro Asn Leu Asn Ala Asp Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 1 5 10 15
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 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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<400> 37
 Val Asp Asn Lys Phe Asn Lys Glu Met Arg Gln Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Lys Leu Pro Asn Leu Asn Pro Gly Gln Ser Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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<400> 38
 Val Asp Asn Lys Phe Asn Lys Glu Met Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Ala Leu Leu Pro Asn Leu Asn Asn Met Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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<400> 39

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Val Asp Asn Lys Phe Asn Lys Glu Phe Arg Lys Ala Tyr Trp Glu Ile
 1      5      10      15
Ala Leu Leu Pro Asn Leu Asn Lys Trp Gln Ser Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
      50      55

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<400> 40

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Val Asp Asn Lys Phe Asn Lys Glu Met Arg Lys Ala Tyr Trp Glu Ile
 1      5      10      15
Ala Leu Leu Pro Asn Leu Asn Arg Trp Gln Ile Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
      50      55

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<210> 41

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<400> 41

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Val Asp Asn Lys Phe Asn Lys Glu Met Arg Gln Ala Tyr Trp Glu Ile
 1      5      10      15
Val Leu Leu Pro Asn Leu Asn Arg Trp Gln Thr Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
      50      55

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<400> 42

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Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Lys Ala Tyr Trp Glu Ile

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SEQLIST 10563310.TXT

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1           5           10           15
Val Gly Leu Pro Asn Leu Asn Arg Glu Gln Asn Arg Ala Phe Ile Arg
                20                25                30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
                35                40                45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
    50                55

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<210> 43
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<400> 43
Val Asp Asn Lys Phe Asn Lys Glu Met Arg Thr Ala Tyr Trp Glu Ile
1           5           10           15
Val Gly Leu Pro Asn Leu Asn Asn Gln Gln Lys Arg Ala Phe Ile Arg
                20                25                30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
                35                40                45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
    50                55

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<400> 44
Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Thr Ala Tyr Trp Glu Ile
1           5           10           15
Val Arg Leu Pro Asn Leu Asn Val Asn Gln Thr Arg Ala Phe Ile Arg
                20                25                30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
                35                40                45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
    50                55

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<400> 45
Val Asp Asn Lys Phe Asn Lys Glu Phe Arg His Ala Tyr Trp Glu Ile
1           5           10           15
Val Arg Leu Pro Asn Leu Asn Ala Gly Gln His Arg Ala Phe Ile Arg
                20                25                30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
                35                40                45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys

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 Val Thr Leu Pro Asn Leu Asn Pro Ser Gln His Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Val Asp Asn Lys Phe Asn Lys Glu Met Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Ala Lys Leu Pro Asn Leu Asn Pro Pro Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
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 Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Thr Leu Pro Asn Leu Asn Thr Ser Gln Thr Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

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<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 49

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Asp | Asn | Lys | Phe | Asn | Lys | Glu | Leu | Arg | Lys | Ala | Tyr | Trp | Glu | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gln | Val | Leu | Pro | Asn | Leu | Asn | Val | Arg | Gln | Lys | Arg | Ala | Phe | Ile | Arg |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ser | Leu | Tyr | Asp | Asp | Pro | Ser | Gln | Ser | Ala | Asn | Leu | Leu | Ala | Glu | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Lys | Lys | Leu | Asn | Asp | Ala | Gln | Ala | Pro | Lys | | | | | | |
| | 50 | | | | | 55 | | | | | | | | | |

<210> 50

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 50

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Asp | Asn | Lys | Phe | Asn | Lys | Glu | Pro | Arg | Gln | Ala | Tyr | Trp | Glu | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Leu | Leu | Pro | Asn | Leu | Asn | Arg | Phe | Gln | Lys | Arg | Ala | Phe | Ile | Arg |
| | | | 20 | | | | 25 | | | | | | 30 | | |
| Ser | Leu | Tyr | Asp | Asp | Pro | Ser | Gln | Ser | Ala | Asn | Leu | Leu | Ala | Glu | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Lys | Lys | Leu | Asn | Asp | Ala | Gln | Ala | Pro | Lys | | | | | | |
| | 50 | | | | | 55 | | | | | | | | | |

<210> 51

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 51

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Asp | Asn | Lys | Phe | Asn | Lys | Glu | Met | Arg | Asn | Ala | Tyr | Trp | Glu | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Gly | Leu | Pro | Asn | Leu | Asn | Gln | Gly | Gln | Lys | Arg | Ala | Phe | Ile | Arg |
| | | | 20 | | | | 25 | | | | | | 30 | | |
| Ser | Leu | Tyr | Asp | Asp | Pro | Ser | Gln | Ser | Ala | Asn | Leu | Leu | Ala | Glu | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Lys | Lys | Leu | Asn | Asp | Ala | Gln | Ala | Pro | Lys | | | | | | |
| | 50 | | | | | 55 | | | | | | | | | |

<210> 52

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 52

SEQLIST 10563310.TXT

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Val Asp Asn Lys Phe Asn Lys Glu Pro Arg Gln Ala Tyr Trp Glu Ile
 1      5      10      15
Val Lys Leu Pro Asn Leu Asn Asn Ser Gln Arg Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50      55

```

<210> 53
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

```

<400> 53
Val Asp Asn Lys Phe Asn Lys Glu Asn Arg Thr Ala Tyr Trp Glu Ile
 1      5      10      15
Val Arg Leu Pro Asn Leu Asn Ser Ala Gln Lys Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50      55

```

<210> 54
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

```

<400> 54
Val Asp Asn Lys Phe Asn Lys Glu Met Arg Asn Ala Tyr Trp Glu Ile
 1      5      10      15
Val Leu Leu Pro Asn Leu Asn Arg Trp Gln Ser Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50      55

```

<210> 55
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

```

<400> 55
Val Asp Asn Lys Phe Asn Lys Glu Met Arg Thr Ala Tyr Trp Glu Ile
 1      5      10      15
Val Ile Leu Pro Asn Leu Asn Lys Trp Gln Ile Arg Ala Phe Ile Arg
      20      25      30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
      35      40      45

```

Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
50 55

<210> 56
<211> 58
<212> PRT
<213> Artificial Sequence

<220>
<223> Chemically synthesized

<400> 56
Val Asp Asn Lys Phe Asn Lys Glu Met Arg Asn Ala Tyr Trp Glu Ile
1 5 10 15
Ala Leu Leu Pro Asn Leu Asn Val Ala Gln Lys Arg Ala Phe Ile Arg
20 25 30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
35 40 45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
50 55

<210> 57
<211> 58
<212> PRT
<213> Artificial Sequence

<220>
<223> Chemically synthesized

<400> 57
Val Asp Asn Lys Phe Asn Lys Glu Phe Arg Gln Ala Tyr Trp Glu Ile
1 5 10 15
Val Lys Leu Pro Asn Leu Asn Ser Gly Gln His Arg Ala Phe Ile Arg
20 25 30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
35 40 45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
50 55

<210> 58
<211> 58
<212> PRT
<213> Artificial Sequence

<220>
<223> Chemically synthesized

<400> 58
Val Asp Asn Lys Phe Asn Lys Glu Met Arg Thr Ala Tyr Trp Glu Ile
1 5 10 15
Val Lys Leu Pro Asn Leu Asn Ile Ala Gln Asn Arg Ala Phe Ile Arg
20 25 30
Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
35 40 45
Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
50 55

<210> 59
<211> 58

SEQLIST 10563310.TXT

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 59

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Asp | Asn | Lys | Phe | Asn | Lys | Glu | Leu | Arg | Thr | Ala | Tyr | Trp | Glu | Ile |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Val | Ser | Leu | Pro | Asn | Leu | Asn | Arg | Asn | Gln | Ser | Arg | Ala | Phe | Ile | Arg |
| | | 20 | | | | 25 | | | | | | 30 | | | |
| Ser | Leu | Tyr | Asp | Asp | Pro | Ser | Gln | Ser | Ala | Asn | Leu | Leu | Ala | Glu | Ala |
| | 35 | | | | | 40 | | | | | 45 | | | | |
| Lys | Lys | Leu | Asn | Asp | Ala | Gln | Ala | Pro | Lys | | | | | | |
| | 50 | | | | | 55 | | | | | | | | | |

<210> 60

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 60

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Asp | Asn | Lys | Phe | Asn | Lys | Glu | Met | Arg | Asn | Ala | Tyr | Trp | Glu | Ile |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Val | Lys | Leu | Pro | Asn | Leu | Asn | Pro | Gly | Gln | Ser | Arg | Ala | Phe | Ile | Arg |
| | | 20 | | | | 25 | | | | | | 30 | | | |
| Ser | Leu | Tyr | Asp | Asp | Pro | Ser | Gln | Ser | Ala | Asn | Leu | Leu | Ala | Glu | Ala |
| | 35 | | | | | 40 | | | | | 45 | | | | |
| Lys | Lys | Leu | Asn | Asp | Ala | Gln | Ala | Pro | Lys | | | | | | |
| | 50 | | | | | 55 | | | | | | | | | |

<210> 61

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 61

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Asp | Asn | Lys | Phe | Asn | Lys | Glu | Met | Arg | Gln | Ala | Tyr | Trp | Glu | Ile |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Ala | Leu | Leu | Pro | Asn | Leu | Asn | Arg | Trp | Gln | Ile | Arg | Ala | Phe | Ile | Arg |
| | | 20 | | | | 25 | | | | | | 30 | | | |
| Ser | Leu | Tyr | Asp | Asp | Pro | Ser | Gln | Ser | Ala | Asn | Leu | Leu | Ala | Glu | Ala |
| | 35 | | | | | 40 | | | | | 45 | | | | |
| Lys | Lys | Leu | Asn | Asp | Ala | Gln | Ala | Pro | Lys | | | | | | |
| | 50 | | | | | 55 | | | | | | | | | |

<210> 62

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

SEQLIST 10563310.TXT

<400> 62

Val Asp Asn Lys Phe Asn Lys Glu Phe Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Ala Val Leu Pro Asn Leu Asn Asn Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 63

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically synthesized

<400> 63

Val Asp Asn Lys Phe Asn Lys Glu Cys Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Lys Leu Pro Asn Leu Asn Asn Ala Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 64

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically synthesized

<400> 64

Val Asp Asn Lys Phe Asn Lys Glu Pro Lys Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Val Leu Pro Asn Leu Asn Ser Lys Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 65

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically synthesized

<400> 65

Val Asp Asn Lys Phe Asn Lys Glu Met Arg Asn Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Thr Leu Pro Asn Leu Asn Lys Trp Gln Ile Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala

SEQLIST 10563310.TXT

Lys Lys 35 40 45
 50 Leu Asn Asp Ala Gln Ala Pro Lys
 55

<210> 66
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 66
 Val Asp Asn Lys Phe Asn Lys Glu Met Arg Lys Ala Tyr Trp Glu Ile
 1 5 10 15
 Ala Thr Leu Pro Asn Leu Asn Lys Ser Gln Ser Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 67
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 67
 Val Asp Asn Lys Phe Asn Lys Glu Phe Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Thr Leu Pro Asn Leu Asn Val Gly Gln Thr Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 68
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 68
 Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Gly Leu Pro Asn Leu Asn Thr Arg Gln Ser Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 69

SEQLIST 10563310.TXT

<211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 69
 Val Asp Asn Lys Phe Asn Lys Glu Leu Arg His Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Gln Leu Pro Asn Leu Asn Arg Glu Gln Gly Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 70
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 70
 Val Asp Asn Lys Phe Asn Lys Glu Phe Arg His Ala Tyr Trp Glu Ile
 1 5 10 15
 Ile Lys Leu Pro Asn Leu Asn Gly Lys Gln His Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 71
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 71
 Val Asp Asn Lys Phe Asn Lys Glu Met Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Ser Leu Pro Asn Leu Asn Thr Leu Gln Ser Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 72
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

SEQLIST 10563310.TXT

<400> 72

Val Asp Asn Lys Phe Asn Lys Glu Met Arg Lys Ala Tyr Trp Glu Ile
 1 5 10 15
 Gln Gly Leu Pro Asn Leu Asn Asn Arg Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 73

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 73

Val Asp Asn Lys Phe Asn Lys Glu Met Arg Asn Ala Tyr Trp Glu Ile
 1 5 10 15
 Ala Lys Leu Pro Asn Leu Asn Arg Glu Gln Lys Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 74

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 74

Val Asp Asn Lys Phe Asn Lys Glu Met Arg His Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Gly Leu Pro Asn Leu Asn Met Ile Gln Gln Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 75

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Chemically Synthesized

<400> 75

Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Asn Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Lys Leu Pro Asn Leu Asn Arg Ala Gln Asn Arg Ala Phe Ile Arg
 20 25 30

SEQLIST 10563310.TXT

Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 76
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 76
 Val Asp Asn Lys Phe Asn Lys Glu Leu Arg Thr Ala Tyr Trp Glu Ile
 1 5 10 15
 Ile Lys Leu Pro Asn Leu Asn Asn Tyr Gln Arg Arg Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 77
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 77
 Val Asp Asn Lys Phe Asn Lys Glu Pro Arg Glu Ala Tyr Trp Glu Ile
 1 5 10 15
 Gln Arg Leu Pro Asn Leu Asn Asn Lys Gln Lys Thr Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 78
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 78
 Val Asp Asn Lys Phe Asn Lys Glu Met Tyr Ala Ala Tyr Trp Glu Ile
 1 5 10 15
 Ile Asp Leu Pro Asn Leu Asn Thr Pro Gln Ile His Ala Phe Ile Arg
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

SEQLIST 10563310.TXT

<210> 79
 <211> 58
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chemically Synthesized

<400> 79
 Val Asp Asn Lys Phe Asn Lys Glu Thr Arg Ser Ala Tyr Trp Glu Ile
 1 5 10 15
 Val Asn Leu Pro Asn Leu Asn Gln Gly Gln Arg His Ala Phe Ile Lys
 20 25 30
 Ser Leu Tyr Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 35 40 45
 Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys
 50 55

<210> 80
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer Sequence

<400> 80
 gcttccggct cgtatgttgt gtg 23

<210> 81
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer Sequence

<220>
 <221> misc_feature
 <222> (1)...(1)
 <223> 5'-biotinylation

<400> 81
 cggaaccaga gccaccaccg g 21

<210> 82
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer Sequence

<220>
 <221> misc_feature
 <222> (1)...(1)
 <223> 5'-biotinylation

<400> 82
 cggaaccaga gccaccaccg g 21